Name:

## Quiz 5

Please, write clearly and justify all your statements using the material covered in class to get credit for your work.

(1)[5Pts] Prove that the sequence below is monotone and bounded. Next find its limit.

$$s_1 = 2, \quad s_{n+1} = \frac{1}{4}(2s_n + 7), \quad n \ge 1.$$

(1) [3Pts] Prove or give a counterexample:

- (a) Every monotone sequence converges.
- (b) If  $(a_n)$  and  $(b_n)$  are monotone sequences, then  $(c_n) = (a_n + b_n)$  is also a monotone sequence.
- (c) If  $(a_n)$  and  $(b_n)$  are monotone non-decreasing sequences, then  $(c_n) = (a_n + b_n)$  is also a monotone non-decreasing sequence.